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Eco-friendly microwave-assisted diels-alder reactions in ionic liquid influenced by minerals

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Diels-Alder reaction is an important organic synthetic tool between a conjugated diene and a substituted alkene commonly called dienophile to form a substituted adduct. Green synthesis of Diels–Alder adduct has become increasingly popular as it is an environmentally benign process. The present work deals with the mineral supported (LiNTf2, Sc(OTf)3,Y(OTf)3) and microwave assisted, green synthetic protocol for Diels-Alder reaction between cyclohexadiene and a series of two dienophiles (maleic anhydride and 1,4-benzoquinone) in 3-methyl-1-octyl-imidazoliumtetrachloroaluminate, [MOIM]AlCl4 ionic liquid in various reaction conditions. Conventional reactions were carried out at 25°C and microwave-induced reactions at 60°C in a Biotage microwave reactor. Remarkable benefits of microwave technology over conventional methodology are realized which include simple execution, efficient solid supports for rate enhancement and excellent yield of Diels-Alder adduct.The ionic liquid homogenized with solid support solvent system was recycled in both the techniques and the results showed that the ionic liquids could be reused at least for five times without appreciable loss of its catalytic activity. The overall work-up reveals a fact that microwave technique has given excellent yields within few minutes or seconds in various reaction conditions whereas conventional magnetic stirring method proceeded in hours to give expected yields. All the reactions were monitored by GCMS/LCMS spectrophotometers and their enatioselectivities were analyzed by 1H NMR, 13C NMR, UV-Vis, FT-IR and GCMS/LCMS spectrometers.

Biography

G Vinoth Kumar is currently doing his PhD degree in Green Chemistry in Bharathiar University, Tamil Nadu, India. Currently he is working as Post Graduate Teacher of Chemistry in a Government Higher Secondary School, Tamil Nadu, India. He has published one research paper in the field of Green Synthesis. His fields of research interest include Green Chemistry, Organic Synthesis, and Kinetics.

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